

ATSDR

AGENCY FOR TOXIC SUBSTANCES
AND DISEASE REGISTRY

*Agency for Toxic Substances
and Disease Registry*

ATSDR

Purpose of the Presentation

- To communicate our assessment of the Spring Valley
 - Environmental and health data
 - Community concerns and surveys
 - Scientific literature related to diseases of community concern

Overall Conclusion

- No community-wide adverse health effects expected due to American University Experiment Station activities.
- Excluding burial pits/disposal areas, contaminants in Spring Valley are below levels that may cause adverse health effects.

Arsenic

No Adverse Health Effects Expected

Soil
Concentrations;
Estimated
Exposure Doses

Exposure
Investigations:
Hair
Urine
Dust

DC DOH
Arsenic-related
Cancer Study

Other (Non-Arsenic) Contaminants

No Adverse Health Effects Expected

Contaminants at
low levels and
infrequently detected
outside of burials

Contaminants released
more than 80 years ago
have degraded and
in general become
less toxic

Low environmental persistence of many
AUES chemicals (except for some
contaminants like metals)

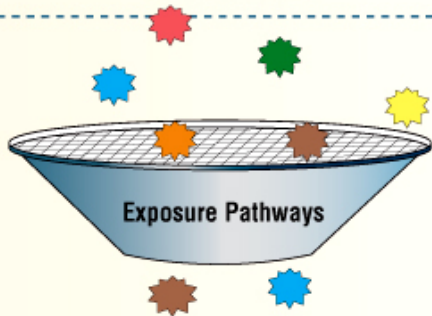
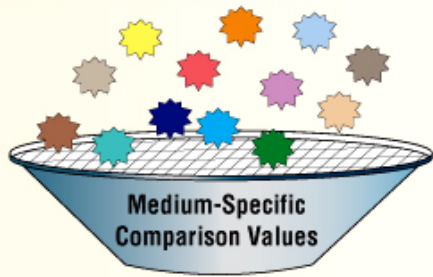
Preliminary Screening of
Chemicals

Pathway Evaluation

Exposure Dose Comparison

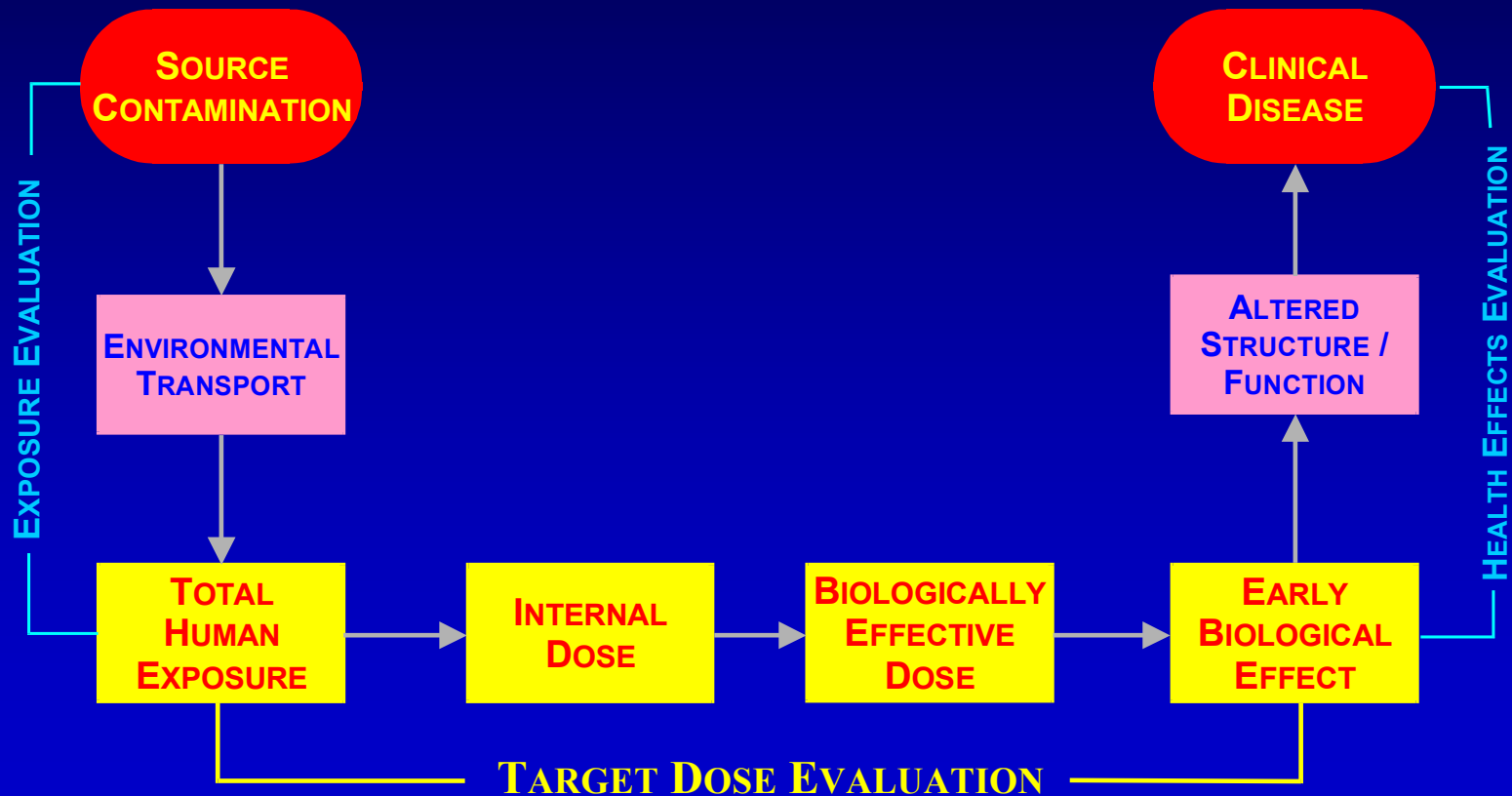
Contaminants of Concern

Public Health Implications



Public Health Implications Evaluation—

Continuum for Relating Environmental Contamination with Clinical Disease



Spring Valley Soil Data

- Area-wide sampling for arsenic
- Central Testing Area- Sampling for chemical warfare agents (CWAs) and their breakdown products; and/or explosives and their transformation products based on presence of a Point of Interest
 - Each property got a boring
 - Each boring analyzed for arsenic; analysis for other constituents was dependent on Point of Interest
- Comprehensive Sampling Area- Sampling for CWA and their breakdown products on 15% of properties
 - Targeted soil borings also conducted at these properties
- AUES list sampling results for OU4 residences, Sedgwick Trench, the Child Development Center (CDC), and American University lot 12

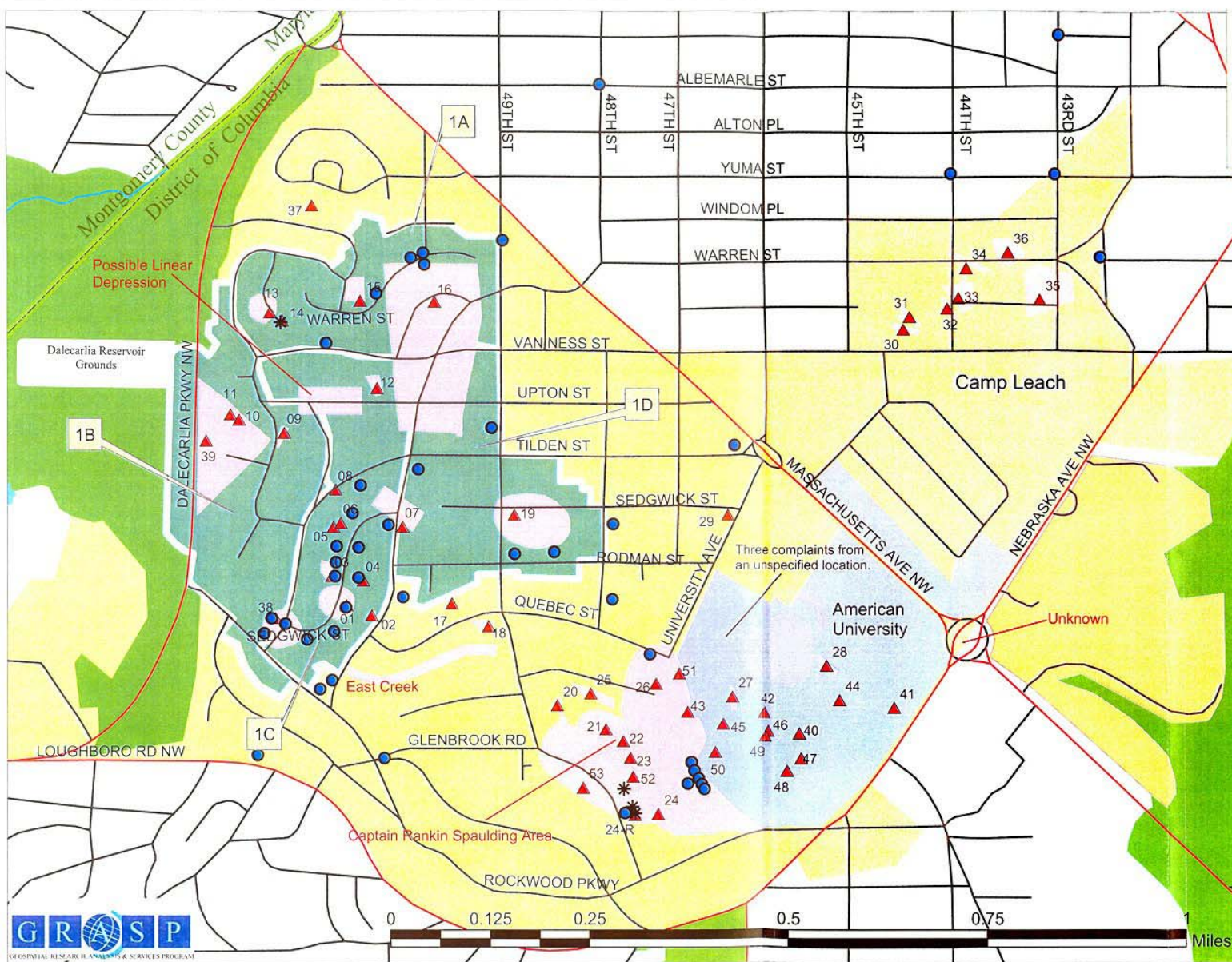
Additional Environmental Sampling

- Burial pits/disposal areas- soil, glassware, munitions
- Air data - indoor samples from 2 residences
- Water data - checked arsenic concentrations in municipal water system

Figure 2

American University and the
Spring Valley Neighborhood:
Points and Areas of Interest

Health Complaints
From DC DOH Hot Line *

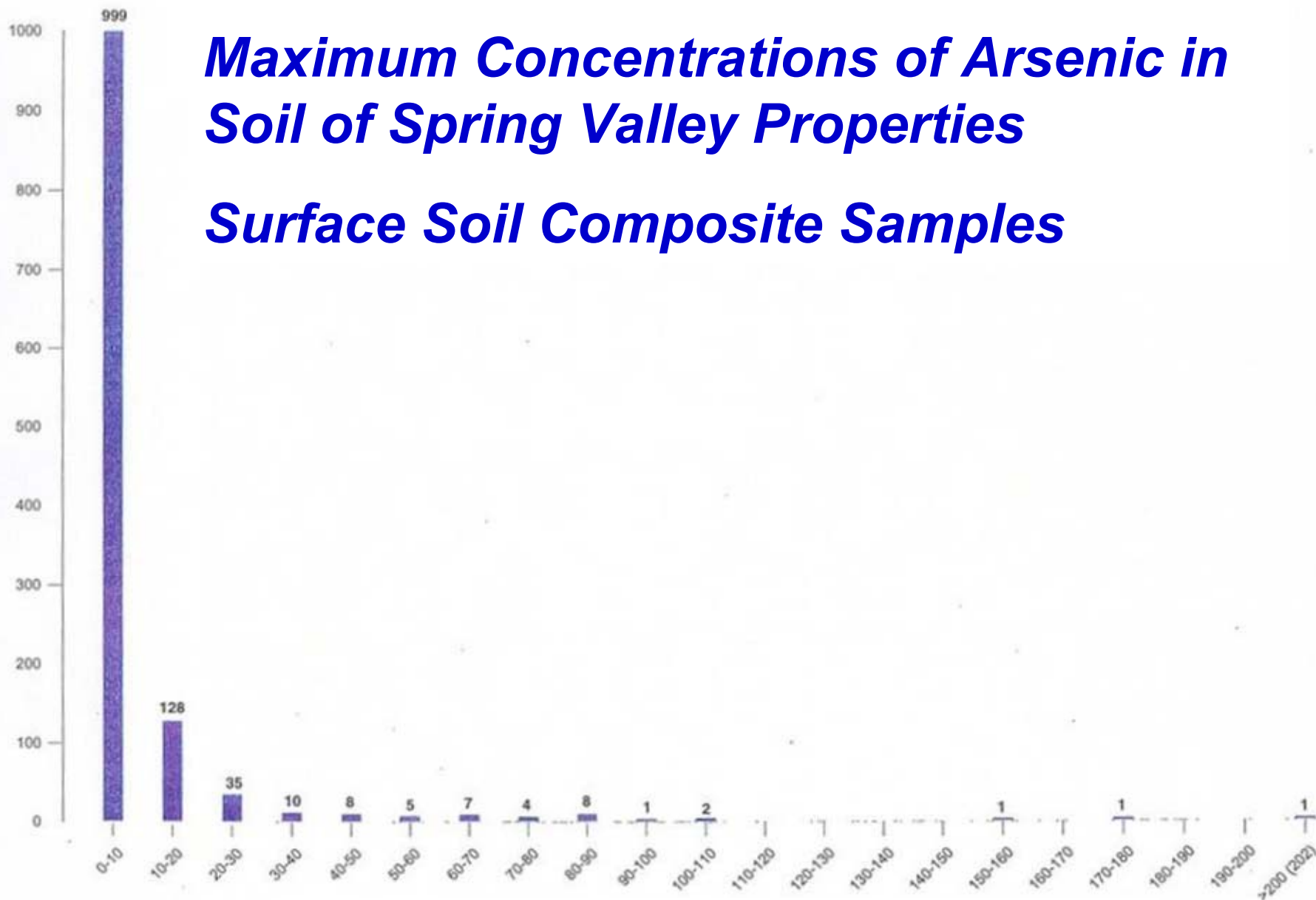


POI	DESCRIPTION
01	Circular Trenches
02	Possible Pit
03	Small Crater Scars
04	Possible Pit
05	Possible Pit
06	Possible Target or Test Site
07	Possible Test Area
08	Possible Target or Test Site
09	Possible Firing or Obsv Stalls
10	Possible Target or Test Site
11	Scattered Ground Scars
12	Possible Graded Area
13	Circular Trenches
14	Burial Pit
15	Ground Scar
16	Chem Persistence Test Area
17	Possible Pit
18	Small Crater Scars
19	Old Mustard Field
20	Ground Scar
21	Shell Pit
22	Shell Pit
23	Shell Pit
24	Probable Pit
24-R	Burial Pit, Revised Location
25	Possible Trenches
26	Small Crater Scars
27	Probable Trench or Ditch
28	Probable Trench or Ditch
29	Ground Scar
30	Training Trenches
31	Training Trenches
32	Training Trenches
33	Training Trenches
34	Training Trenches
35	Training Trenches
36	Training Trenches
37	Mill Creek
38	Bradley Fld/Major Tolman's Fld
39	Static Test Fire Area
40	Ohio Hall
41	History Building
42	Physiological Laboratory
43	Gun Pit
44	Chem Research Laboratory
45	Explosives Laboratory
46	Cannister Laboratory
47	Bacteriological Laboratory
48	Dispersols Laboratory
49	Pharmacological Laboratory
50	Gun Pit
51	Fire and Flame Laboratory
52	Electrolytic Laboratory
53	Baker Valley

●	Burial Pits
●	Location of Health Complaint(s)
▲	POI - Points Of Interest
AOI	Areas Of Interest
American University	American University
Spring Valley	Spring Valley
Central Testing Area	Central Testing Area

Maximum Concentrations of Arsenic in Soil of Spring Valley Properties Surface Soil Composite Samples

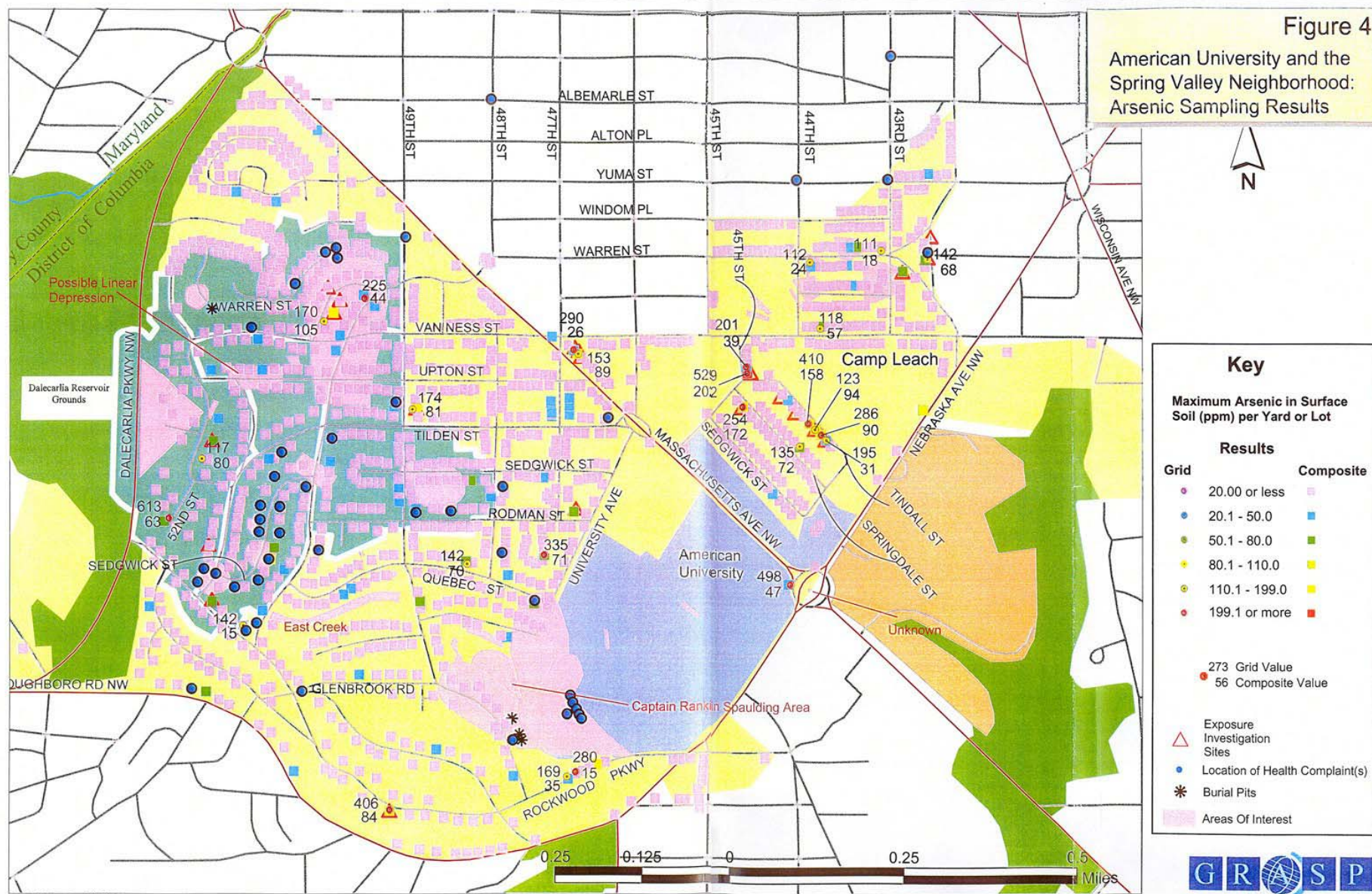
Frequency (# of samples)



Maximum concentration (ppm) for each property

Figure 4

American University and the
Spring Valley Neighborhood:
Arsenic Sampling Results



Exposure Investigations

Sampling results indicate that harmful exposures are not occurring:

- February 2001, Child Development Center (CDC), hair
- February 2001, Washington Occupational Health Association Investigation, CDC, hair, urine
- March 2002, Spring Valley residents with the highest concentrations of arsenic in their yards, hair, urine, indoor dust
- Summer 2002, Spring Valley residents who participated in March 2002, conducted during soil removals, urine

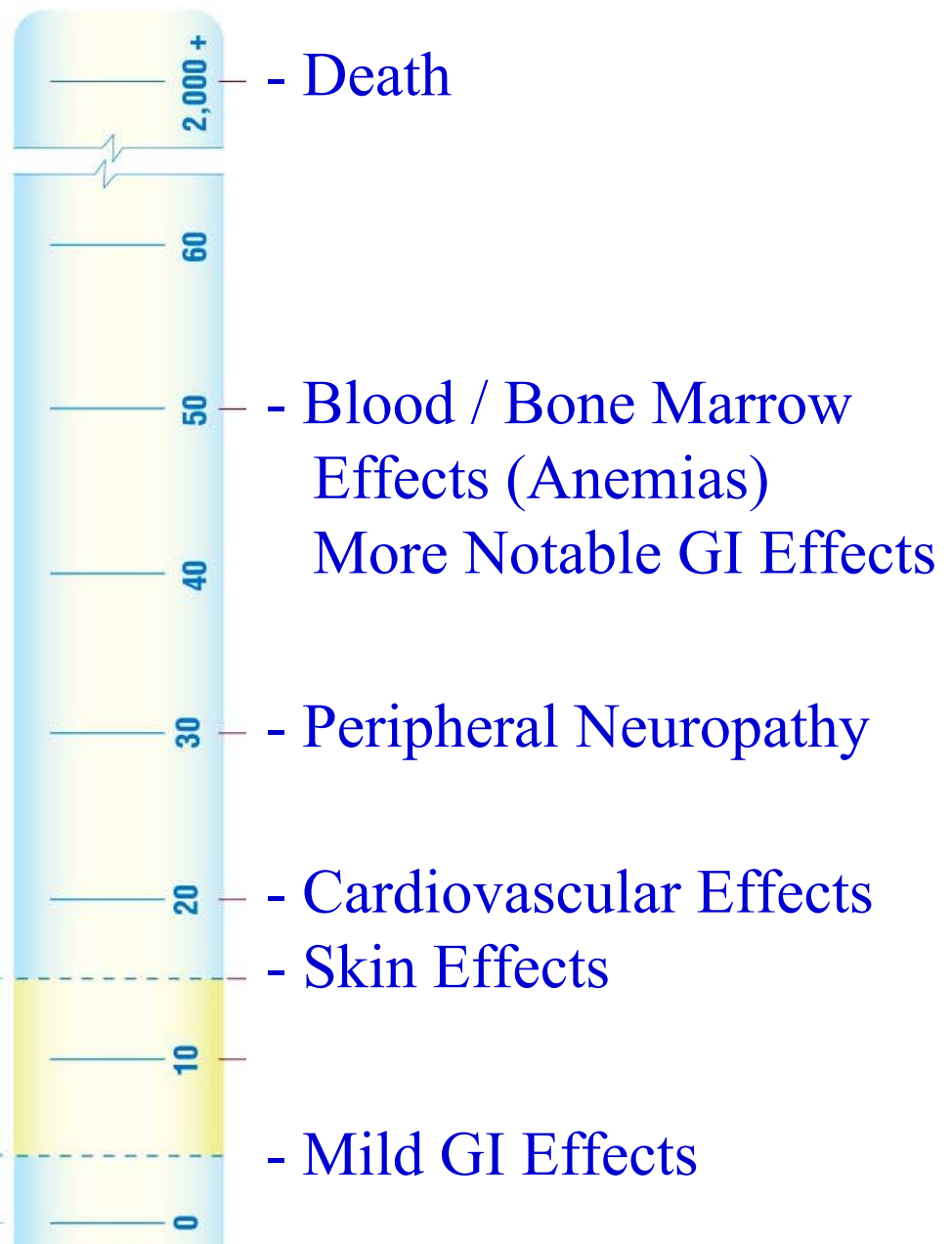
Comparison of Spring Valley Arsenic Doses with Lowest Levels Reported to Cause Illness / Disease

(10^{-3} mg/kg/day)

* Assumes possible acute exposure of up to 529 ppm arsenic in soil and possible longer term exposure of up to 202 ppm arsenic in soil.

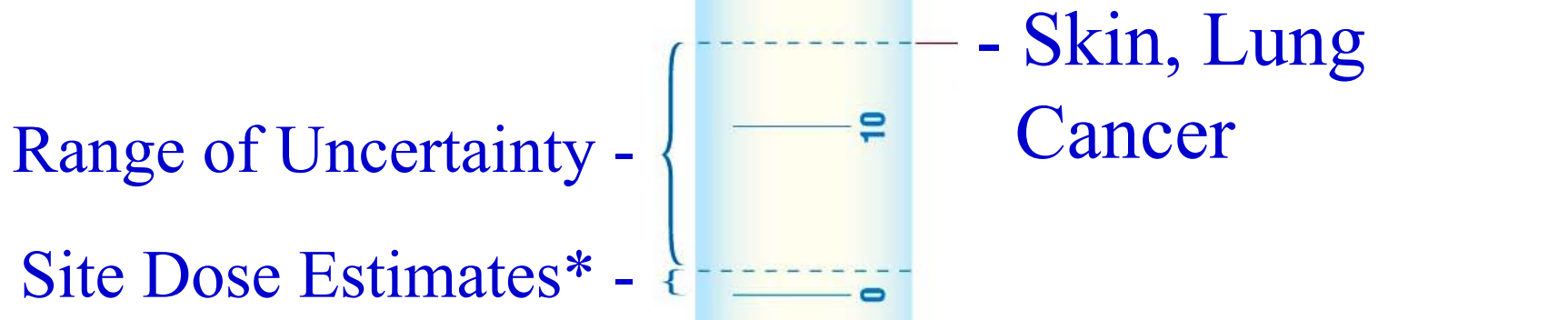
Poss. Detoxification Range - {

Site Dose Estimates* - {



Comparison of
Spring Valley
Arsenic Doses with
Lowest Reported
Cancer Effect
Levels

(10^{-3} mg/kg/day)



* Assumes possible exposure at up to 202 ppm arsenic in soil

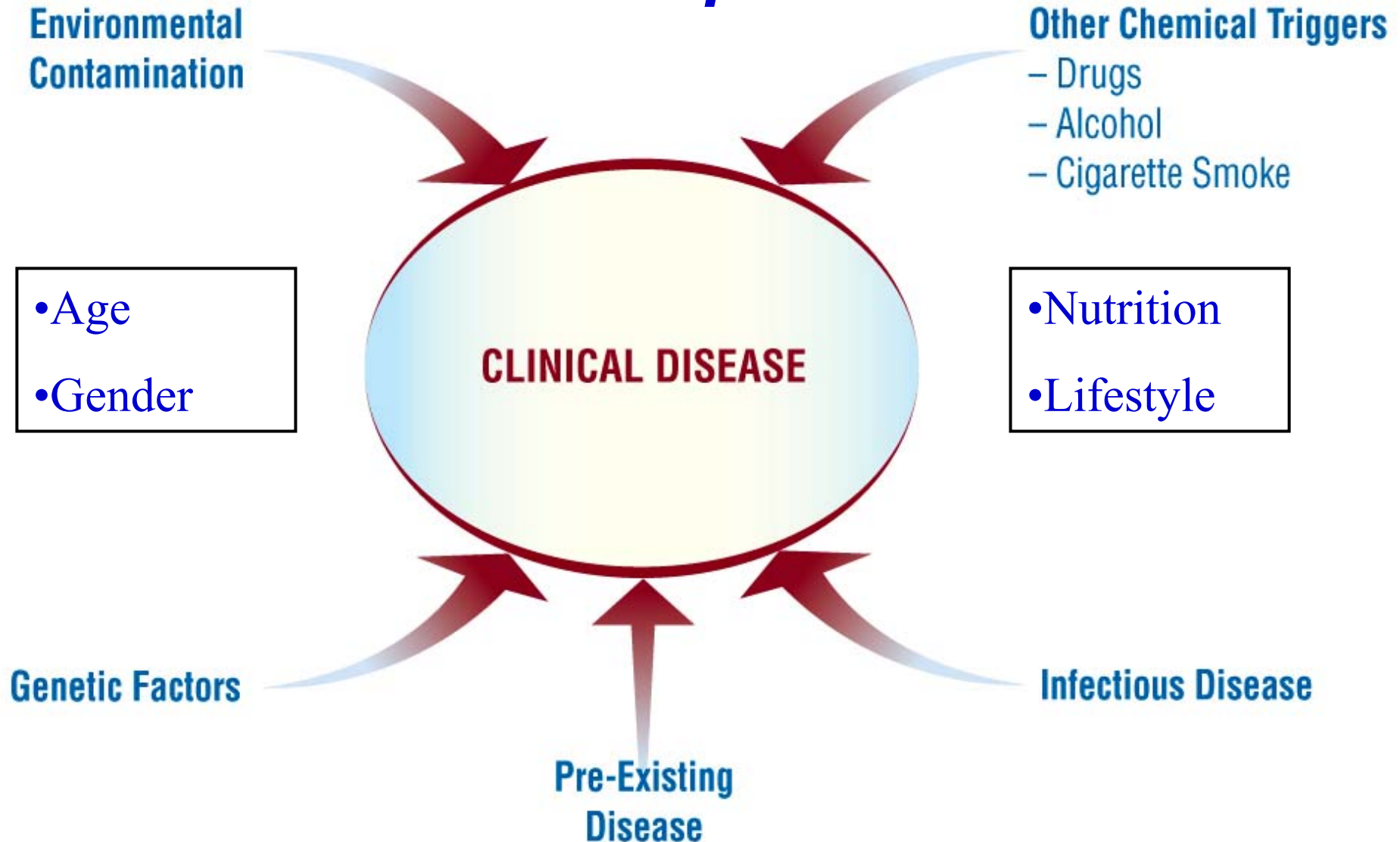
DC DOH Study on Arsenic-related Cancers

- Cancers evaluated: urinary bladder, melanoma skin, lung, liver and kidney
- Compared Spring Valley area to:
 1. adjacent tract
 2. tract in Potomac, MD
- No excesses of arsenic-related cancer incidence and mortality during the study period 1987-1998

Other Contaminants in Soil (ppm)

Contaminant	Max. Value Residences Surface	Max. Value CDC AU Lot12 Subsurface
Benzo(a)-pyrene	0.720J	1.1J
Phosphorus	1,530	678
Thiodigylcol TDG	0.813J	0.732J

Multiple Factors Associated with Disease Development



DC DOH Hotline Records

- March 2001-2002
- one or more reported illnesses or health conditions from 46 separate residences
- a wide range of conditions reported
- more than one third of the conditions were disorders of the blood and bone marrow
- ATSDR evaluated brain cancer mortality rates: SV Ward 3 rates similar to DC area and national rates_{ATSDR}

Community Surveys of Self-reported Health Conditions

- Adverse health conditions reported from 61 residences (expanded to 161 residences). Results similar to DC DOH hot line reports (reporting from additional residents provided additional cases of leukemias and peripheral neuropathy)
- ATSDR evaluated the 1999 leukemia mortality rate for SV Ward 3: approximately twice as high as the DC and national rates

Community Concerns

- Do contaminants associated with American University Experiment Station cause the types of disease found in Spring Valley?
 - Yes.
- Are contaminant levels in the environment high enough to cause disease?
 - No. Except for burial pits/disposal areas, contamination in site soil, air, and water are below levels that would cause harm to children and adults.

Conclusions

- *Soil*- not expected to result in adverse health effects
- *Burial pits and shallow disposal areas*- potential for exposure to hazardous materials if their contents are tampered with or disturbed
- Arsenic and other chemicals are below levels that may cause adverse health effects

Environmental Recommendations

- Targeted surface soil sampling of selected residential yards
- Continue soil gas sampling near burial pits/disposal areas
- Groundwater monitoring near burial pits/disposal areas

Recommendations to Residents

- Call USACE (410-962-0157 or 800-434-0988) if suspicious objects are found in your yards
 - If there is any concern regarding an item possibly being a munition, you should call 911
- Do not collect or handle such objects; remove any such objects presently in the home
- Follow the guidance in the brochure *Safe Gardening, Safe Play, and a Safe Home*
- Report suspect illnesses to your physicians and direct them to ATSDR's healthcare providers link at www.atsdr.cdc.gov/sites/springvalley

Health Follow-up

- Although no exposure to contamination that would lead to leukemia has been found, the DC DOH could determine any excess rates by evaluating incidence and mortality of these diseases.
- ATSDR recommends that contaminant levels in exposure pathways continue to be addressed.

ATSDR Contacts

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Comments on Public Health Assessment

- Mail comments to:
Records Center
ATSDR
ATTN: Spring Valley Chemical Munitions
1600 Clifton Road, N.E. (MS E-60)
Atlanta, GA 30333
- Comments Due Date Extended
 - now due by April 29, 2005